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| Notice of Allowability | Application No. | Applicant(s) | |
| | 09/917,437 | NADKARNI ET AL. | |
| | Examiner | Art Unit | |
| | Tung S Lau | 2863 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5-3-2004.
2. ☒ The allowed claim(s) is/are 1-19.
3. ☒ The drawings filed on 27 July 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____ 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
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DETAILED ACTION

Prior art cited

1. U.S. Patent 4696112 talk about a bore hole navigator utilizing a two axis directional gyro on the inner frame of the navigator and a single axis accelerometer on the outer frame is disclosed. This allows the inner frame of the navigator and thus the entire navigator to be smaller in diameter, both because of the removal of the acceleration axis to the outer gimbal and because the optional electrolytic level sensor, if used, is much smaller than a single axis accelerometer. The overall smaller diameter is maintained by using a belted design wherein the gyro/electrolytic level sensor, the inner frame torque/gear and the inner frame resolver are connected in series along the length of the navigator, with a high gear reduction ratio on the inner frame torquer providing a positive drive within a smaller diameter. This configuration, together with unique calculation algorithms allows smaller diameter and deeper holes to be surveyed.

Allowable Subject Matter

2. Claims 1-19 are allowed.

Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance:

Independent claims 1, 10 and 17 contain allowable subject matter. None of the prior art of record shows or fairly suggests the claimed invention.

Regarding claim 1:

The primary reason for the allowance of claim 1 is the inclusion a method for simultaneously determining respective scale factors or alignment angles of sensitive axes in a multi-axis accelerometer device for measuring acceleration, comprising the steps of determining respective scale factors or alignment angles of the multiple axes of the multi-axis accelerometer device wherein respective Fourier transforms of the respective received outputs of the accelerometer device are combined with Fourier transforms of the predicted outputs of an ideal accelerometer, the predicted outputs based on the tilt angle of the turntable, the angular velocity of the ideal accelerometer, and the local gravity vector. It is these features found in the claim, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes this claim allowable over the prior art.

Claims 2-9 are allowed due to their dependency on claim 1.

Regarding claim 10:

The primary reason for the allowance of claim 10 is the inclusion a system for simultaneously determining respective scale factors or alignment angles of a multi-axis accelerometer device for measuring acceleration, comprising Fourier transforms of the logged outputs of the accelerometer device with a Fourier transform of the predicted output of an ideal accelerometer, the predicted output based on the tilt angle of the turntable, the angular velocity of the ideal

accelerometer and the local gravity vector. It is these features found in the claim, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes this claim allowable over the prior art.

Claims 11-16 are allowed due to their dependency on claim 10.

Regarding claim 17:

The primary reason for the allowance of claim 17 is the inclusion a method for simultaneously determining respective scale factors or alignment angles of sensitive axes in a multi-axis accelerometer device for measuring acceleration, comprising the steps of determining respective scale factors or alignment angles of the multiple axes of the accelerometer device by combining the Fourier transforms of the respective received outputs of the accelerometer device with a Fourier transform of the predicted outputs of an ideal accelerometer, the predicted outputs based on the tilt angle of the turntable, the angular velocity of the ideal accelerometer, and the local gravity vector. It is these features found in the claim, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes this claim allowable over the prior art.

Claims 18-19 are allowed due to their dependency on claim 17.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should

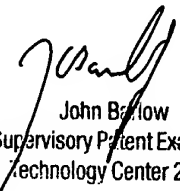
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preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 703-872-9306

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TL


John Barlow
Supervisory Patent Examiner
Technology Center 2800